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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,792	02/05/2004	Phillip C. Cagle	200316243-1	5227

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EXAMINER
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SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

MAIL DATE	DELIVERY MODE
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05/15/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/772,792

Applicant(s)

CAGLE, PHILLIP C.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2007.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-18, 23, 25-32, 37, 39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-18, 23, 25-32, 37, 39 and 40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

#### **Continued Examination Under 37 CFR 1.114**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/26/07 has been entered.
2. All outstanding rejections are overcome by applicant's amendment filed 2/26/07.

#### **Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 12-17, 23, 25-31, 37, and 39-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (U.S. 2004/0063807) in view of the evidence given in *Hawley's Condensed Chemical Dictionary*.

Wang et al. disclose system for printing images comprising ink jet ink, non-porous substrate such as metal, plastic or glass, thermal printer, and heating element for heating the image once it is printed onto the non-porous substrate. It is disclosed that the ink comprises aqueous liquid vehicle, 10-60% volatile cosolvent having boiling point less than 285 °C, i.e. ethylene glycol methyl ether, propylene glycol methyl ether, triethylene, diethylene, or ethylene glycol (humectant), etc., silicone surfactant or fluorine surfactant, and polymer latex, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle wherein the polymer is formed from less than 50 mol% hydrophilic monomer such as (meth)acrylic acid and is obtained from crosslinking monomer, i.e. divinylbenzene or trimethylolpropane triacrylate. Given that the polymer is obtained from hydrophilic monomer such as (meth)acrylic acid, it is clear that the polymer would have acid group on its surface. There is no requirement that the ink comprise non-volatile solvent. It is disclosed that the heating element heats the printed image to temperatures of 50-150 °C which includes temperatures that would inherently drive off the volatile solvent as presently claimed which would inherently improve image permanence as presently claimed. For instance, given that it is well known, as evidenced by *Hawley's Condensed Chemical Dictionary* (page 470), that ethylene glycol methyl ether has boiling point of 124.5 °C, it is clear that when the image is heated at 50-150 °C, the solvent, i.e. ethylene glycol methyl ether, will be driven off as required in present claim 39. There is also disclosed method of printing an image with good rub resistance comprising ink jetting from the printer the ink onto substrate followed by heating the printed image (paragraphs 7, 14-19, 21, 23 (lines 3-4), 33 (lines 1-5 and last 7 lines), 42-45, 47, 51, 53 (line 4), 54, and 103).

In light of the above, it is clear that Wang et al. anticipates the present claims.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 18 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (U.S. 2004/0063807) in view of Miyabayashi (U.S. 2004/0229974).

The disclosure with respect to Wang et al. in paragraph 4 above is incorporated here by reference.

The difference between Wang et al. and the present claimed invention is the requirement in the claims of specific amount of crosslinking monomer.

Wang et al. disclose that the polymer is obtained from crosslinking monomer, however, there is no disclosure of the amount of crosslinking monomer utilized.

Miyabayashi, which is drawn to ink jet ink, discloses the use of polymer fine particles in the form of resin emulsion, i.e. acid functionalized polymer colloid particulates, where the resin

has acid groups on its surface and is formed from 1-10% acid monomer and 0.2-4% crosslinking monomer wherein the motivation for using 0.2-4% crosslinking monomer is in order to improve ejection stability (paragraph 334-336 and 354).

In light of the motivation for using specific amount of crosslinking monomer disclosed by Miyabayashi as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize polymer obtained from that amount of crosslinking monomer in the ink of Wang et al. in order to produce ink with improved ejection stability, and thereby arrive at the claimed invention.

7. Claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (U.S. 2003/0069329) in view of *Hawley's Condensed Chemical Dictionary* and either Kato et al. (U.S. 6,536,890) or Moffatt et al. (U.S. 5,207,824).

Kubota et al. disclose system for printing images comprising ink jet ink, ink jet printer, non-porous substrate, and heating element. It is disclosed that the ink jet ink comprises aqueous liquid vehicle comprising 0.5-40% volatile co-solvent having boiling point below 285 °C, i.e. ethanol, diethylene glycol (humectant), etc., resin emulsion, i.e. acid functionalized polymer colloid particulates, dispersed in the liquid vehicle where the resin has functional groups on its surface including carboxyl groups and is formed from 0.2-4% crosslinking monomer, and pigment dispersed in the liquid vehicle wherein the pigment is polymer encapsulated pigment. There is no requirement that the ink comprise non-volatile solvent. Given that it is well known, as evidenced by *Hawley's Condensed Chemical Dictionary* (page 459), that ethanol has boiling point of 78.3 °C, it is clear that when the image is heated at 80 °C, the solvent, i.e. ethanol, will

be driven off as required in present claim 39. There is also disclosed method wherein the ink is ejected onto non-porous substrate such as glass, plastic, or coated paper from printer followed by heating the printed image at 80 °C (paragraphs 24-29, 36, 40, 72, 80-81, 101-102, 112-113, 115 (lines 1-4), 117, 166-167, 178, 228-230, 253, 263-264-550-551, 555-558, and 565). Attention is drawn to Ink 4 in Table F2 which discloses ink comprising polymer encapsulated pigment, resin emulsion wherein the resin is obtained from 3% acid monomer and 0.4% crosslinking monomer, and volatile solvent having boiling point below 285 °C, i.e. glycerin, diethylene glycol, and N-methyl-2-pyrrolidone, and to Table F5 which discloses that such ink has good rub resistance

The difference between Kubota et al. and the present claimed invention is the requirement in the claims of the use of thermal ink jet printer.

Kubota et al. each disclose the use of ink jet printer, however, there is no specific disclosure of thermal ink jet printer.

Kato et al., which is drawn to ink jet ink, disclose the use of thermal ink jet printer wherein the ink is ejected on stable basis with no satellite dots produced (col.26, lines 19-25).

Alternatively, Moffatt et al., which is drawn to ink jet ink, disclose the use of thermal ink jet printer given that this printer offers a low cost, high print quality, comparatively noise-free option to other types of printers (col.1, lines 12-14).

In light of the motivation for using thermal ink jet printer disclosed by Kato et al. or Moffatt et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such printer as the printer in Kubota et al. in order to stably print ink and produce no satellite dots or alternatively, in order to print noise free with low cost and high print quality, and thereby arrive at the claimed invention.

8. Claims 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. in view of *Hawley's Condensed Chemical Dictionary* and either Kato et al. or Moffatt et al. as applied to claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-40 above, and further in view of either Miyamoto et al. (U.S. 2004/0055508) or Wang et al. (U.S. 2004/0063807).

The difference between Kubota et al. in view of *Hawley's Condensed Chemical Dictionary* and either Kato et al. or Moffatt et al. and the present claimed invention is the requirement in the claims of silicone surfactant or fluorine surfactant.

Miyamoto et al., which is drawn to ink jet ink, disclose the use of silicone as anti-foaming agent to prevent bubbles from being generated in the ink and/or allowing generated bubbles to disappear (paragraphs 183-184).

Alternatively, Wang et al., which is drawn to ink jet ink, disclose the use of silicone surfactant or fluorinated surfactant in order to control surface tension and thus, the jet velocity, separation length of droplets, drop size, and stream stability of the ink (paragraph 46).

In light of the motivation for using silicone surfactant or fluorinated surfactant disclosed by Miyamoto et al. or Wang et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such surfactant in the ink of Kubota et al. in order to produce ink with no foaming or, alternatively, to produce ink with suitable surface tension, and thereby arrive at the claimed invention.



**Response to Arguments**

9. Applicant's arguments regarding Shinozuka et al. (U.S. 5,750,592) have been considered but they are moot in view of the discontinuation of the use of this reference against the present claims.

10. Applicant's arguments filed 2/26/07 have been fully considered but, with the exception of arguments relating to Shinozuka et al., they are not persuasive.

Specifically, applicant argues that Kubota et al. fails to disclose printing ink jet ink comprising polymer encapsulated pigment and acid functionalized colloid particulates dispersed in liquid vehicle having volatile co-solvent wherein the image is heated after printing. As evidence to support this position, applicant points to examples of Kubota et al. that show ink comprising polymer encapsulated pigment but wherein such ink is not heated after printing or that show ink that is heated after printing but wherein the ink does not comprise polymer encapsulated pigment.

However, the examples are but a few preferred embodiments of Kubota et al. It is noted, "applicant must look to the whole reference for what it teaches. Applicant cannot merely rely on the examples and argue that the reference did not teach others," *In re Courtright*, 377 F.2d 647, 153 USPQ 735,739 (CCPA 1967). Further, "nonpreferred disclosures can be used. A nonpreferred portion of a reference disclosure is just as significant as the preferred portion in assessing the patentability of claims", *In re Nehrenberg*, 280 F.2d 161, 126 USPQ 383 (CCPA 1960). A fair reading of Kubota et al. as a whole clearly discloses ink comprising polymer encapsulated pigment (paragraph 72), acid functionalized colloid particles (paragraphs 102, 112,

and 117), and liquid vehicle (paragraphs 162-168) as presently claimed wherein the image formed from such ink is heated after printing (paragraphs 35 and 230).

Applicant also argues that there is no motivation to combine Kubota et al. with Kato et al. given that, as disclosed on page 14, line 30-page 15, line 6 of the present specification, configuring a system including a thermal ink jet ink architecture often requires additional consideration and experimentation of at least selection of ink components. Applicant argues that Kato et al. also disclose the difficulty of working with thermal ink jet architecture.

However, while the present specification discloses that polymer colloid particulates effective for use in piezo ink jet system are not necessarily effective in thermal ink jet systems, firstly, it is noted that given that Kubota et al. disclose ink jet ink identical to that presently claimed, it would have been obvious to one of ordinary skill in the art that such ink would also be suitable for use in thermal ink jet printer as presently claimed. Secondly, it is noted that there is no requirement in Kubota et al. that the ink is suitable for use in piezo ink jet system and thus, one of ordinary skill in the art would not expect that such ink would not be suitable for use in thermal ink jet system. Additionally, while col.26, lines 25-28 of Kato et al. disclose that when the ink is used with an ink jet printing method, thermal properties of the ink may have to be regulated, this does not teach against using inks in thermal ink jet system only that they may have to be regulated.

While it is agreed that Kato et al. disclose the use of separate liquid composition and ink, however, Kato et al. disclose the use of the ink in a thermal printer and further, the teaching of Kato et al. with respect to the thermal printer, "ink-jet recording method of the type adapted to eject ink by utilizing the foaming phenomenon of ink arises when thermal energy is applied

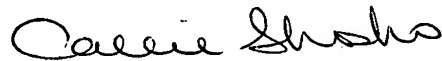
thereto because ink is ejected on a stable basis and no satellite drops will be produced”, appears to refer to the printing apparatus itself not the ink. That is, it is the printer which allows the ink to be ejected on a stable basis and for no satellite drops to be produced. Therefore, it would have been obvious to one of ordinary skill in the art to utilize ink, including that disclosed by Kubota et al., in such thermal ink jet printer, in order to stably print ink and produce no satellite dots, and thereby arrive at the claimed invention.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS

5/8/07